

On Reducing Piping Vibration Levels – Attacking the Source

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ABSTRACT

Centrifugal compressors used in the pipeline market generate very strong noise, which is typically dominated by the blade passing frequency and its higher harmonics. The high level noise is not only very disturbing to the people living nearby the installation site but also causes expensive structural failures in the downstream piping. A novel design of Helmholtz array has been developed to address this type of noise problem. Computational studies show that the installation of the Helmholtz array acoustic liner on the compressor diffuser walls is very effective in reducing noise level of the compressor, especially the dominant blade passing frequency noise. The acoustic liner design has been built and tested at an installation site by the customer. The data clearly shows that the use of acoustic liners is indeed very effective in the reduction of both the noise and the vibration levels of the machine.

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